Solutions: Inference for Relationships Checkpoint

The following questions present you with a scenario, and you need to choose the most appropriate statistical test in each case.

Question 1

Students will see one of the following two questions, chosen at random.

Option 1:

At the beginning of the semester, students who registered for a statistics course were randomly assigned to two sections, each taught by a different instructor. At the end of the semester, we would like to test whether there are differences in performance on the final exam between the two sections.

Select one answer.
10 points

- (a) matched pairs t-test
- (b) two-sample t-test
- (c) ANOVA
- (d) chi-squared test for independence
- (e) inference for regression

Correct answer: (b)

Option 2:

We suspect the overall mean monthly rent of apartments in Shadyside is higher than in Oakland, so we survey a random sample of *Oakland* apartments, and a random sample of *Shadyside* apartments.

Select one answer.
10 points

- (a) matched pairs t-test
- (b) two-sample t-test
- (c) ANOVA
- (d) chi-squared test for independence
- (e) inference for regression

Correct answer: (b)

Question 2

Students will see one of the following two questions, chosen at random.

Option 1:

We suspect that automobile insurance premiums (in dollars) may be steadily decreasing with the driver's driving experience (in years), so we choose a random sample of drivers who have similar automobile insurance coverage and collect data about their ages and insurance premiums.

Select one answer.
10 points

- (a) matched pairs t-test
- (b) two-sample t-test
- (c) ANOVA
- (d) chi-squared test for independence
- (e) inference for regression

Correct answer: (e)

Option 2:

Advertising researchers claim that the power of curiosity can be harnessed to design an effective Internet advertising strategy that results in a better evaluation of the advertised product. They develop six advertising texts with varying amounts of "curiosity" triggers. College students are randomly assigned to one of the six versions of the advertisement text and their evaluation score of the advertised product is recorded.

Select one answer.
10 points

- (a) matched pairs t-test
- (b) two-sample t-test
- (c) ANOVA
- (d) chi-squared test for independence
- (e) inference for regression

Correct answer: (c)

Question 3

Students will see one of the following two questions, chosen at random.

Option 1:

A physical therapy researcher was interested in determining the impact of two different exercises. The investigator suspected that the two exercises produced a different level of activity in the muscle. Each of 16 subjects performed both exercise 1 and exercise 2, and the results are shown (for each subject, the order of the exercises was randomly assigned and sufficient rest time was provided between the two exercises).

Select one answer.
10 points

Subject	Exercise 1	Exercise 2
1	4.53	5.00
2	6.72	7.12
3	3.79	4.21
4	5.82	5.78
5	5.00	6.29
6	4.00	5.13
7	2.19	3.95
8	7.34	7.20
9	9.12	8.95
10	1.79	4.12
11	8.10	9.68
12	7.52	8.25
13	6.25	7.15
14	6.60	7.98
15	7.00	7.10
16	6.23	6.00

- (a) matched pairs t-test
- (b) two-sample t-test
- (c) ANOVA
- (d) chi-squared test for independence
- (e) inference for regression

Correct answer: (a)

Option 2:

To test whether Internet use increases depression score, we measure the depression scores of a random sample of non-Internet-users, have them use the Internet for a specified time, then measure their depression scores again.

Select one answer.
10 points

- (a) matched pairs t-test
- (b) two-sample t-test
- (c) ANOVA
- (d) chi-squared test for independence
- (e) inference for regression

Correct answer: (a)

Question 4

Students will see one of the following two questions, chosen at random.

Option 1:

We select random samples from several racial categories (Caucasian, African-American, Hispanic, Asian-American) to determine if there is a difference in overall mean earnings among the groups.

Select one answer.
10 points

- (a) matched pairs t-test
- (b) two-sample t-test
- (c) ANOVA
- (d) chi-squared test for independence
- (e) inference for regression

Correct answer: (c)

Option 2:

Researchers question whether college students' choice of declared academic major is related to gender.

Select one answer.
10 points

- (a) matched pairs t-test
- (b) two-sample t-test
- (c) ANOVA
- (d) chi-squared test for independence
- (e) inference for regression

Correct answer: (d)

Question 5

Students will see one of the following two questions, chosen at random.

Option 1:

We want to test for a relationship between race and marital status (married/never married/divorced/widowed).

Select one answer.
10 points

- (a) matched pairs t-test
- (b) two-sample t-test
- (c) ANOVA
- (d) chi-squared test for independence
- (e) inference for regression

Correct answer: (d)

Option 2:

We want to explore the relationship between the prices of diamond rings and the weights of their diamond stones.

Select one answer.
10 points

- (a) matched pairs t-test
- (b) two-sample t-test
- (c) ANOVA
- (d) chi-squared test for independence
- (e) inference for regression

Correct answer: (e)

Question 6

Students will see one of the following two questions, chosen at random.

Option 1:

The next three questions refer to the following information:

A researcher wants to explore the relationship between the following two variables, Weight 1 and Weight 2.

Weight 1	Weight 2
130	138
160	156
220	224
125	119
205	213

For each question below, choose the most appropriate inference method to analyze these data, under the given scenarios.

Suppose that Weight 1 is the weight (in pounds) of a sample of five individuals before beginning a weight-loss diet, and Weight 2 us the weight in (pounds) of the **same** five individuals after the diet. If we would like to test the effectiveness of the diet, which of the following is the appropriate inference method?

Select one answer.
10 points

- (a) matched pairs
- (b) two independent samples
- (c) inference for regression

Correct answer: (a)

Option 2:

The next three questions refer to the following information:

Suppose an economist wishes to determine the relationship between the age and price of houses. A study yields the following data:

Worksheet 1 ***

↓	C1	C2
1	27	48
2	49	63
3	35	50
4	51	72
5	42	55

For each question below, choose the most appropriate inference method to analyze these data, under the given scenarios.

If column 1 is the price (in thousands of dollars) of a sample of five houses from ten years ago, and column 2 is the price (in thousands of dollars) of a sample of a different five houses from today, which of the following is the appropriate inference method?

Select one answer.
10 points

- (a) matched pairs
- (b) two independent samples
- (c) inference for regression

Correct answer: (b)

Question 7

Students will see one of the following two questions, chosen to correspond with the scenario they saw in question 6.

Option 1:

In preparing for a balsa wood bridge challenge, students weighed (in g) a random sample of five balsa wood designs and recorded these data as Weight 1. They also recorded the maximum weight (in kg) that the bridge could support. If the students want to know if there is an association between the weight of the bridge (in g) and the maximum weight supported (in kg), which of the following is the appropriate inference method?

Select one answer.
10 points

- (a) matched pairs
- (b) two independent samples
- (c) inference for regression

Correct answer: (c)

Option 2:

If column 1 is the age of the home in years, and column 2 is the price of the home (in thousands of dollars), which of the following is the appropriate inference method?

Select one answer.
10 points

- (a) matched pairs
- (b) two independent samples
- (c) inference for regression

Correct answer: (c)

Question 8

Students will see one of the following two questions, chosen to correspond with the scenario they saw in question 6.

Option 1:

If Weight 1 is the weight (in pounds) of a random sample of five men who were accepted as models, and Weight 2 is the weight (in pounds) of a random sample of five men who were rejected as models, which of the following is the appropriate inference method?

Select one answer.
10 points

- (a) matched pairs
- (b) two independent samples
- (c) inference for regression

Correct answer: (b)

Option 2:

If column 1 is the price (in thousands of dollars) of a sample of five houses from ten years ago, and column 2 is the price (in thousands of dollars) of the same homes today, which of the following is the appropriate inference method?

Select one answer.
10 points

- (a) matched pairs
- (b) two independent samples
- (c) inference for regression

Correct answer: (a)

Save Submit and finish